

SECRET 12/12/92



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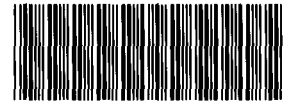
NOV 18 1992

Ref 8HWM--FF

Mr Gary Baughman  
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4300 Cherry Creek Drive South  
Denver, Colorado 80222-1530

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RE Review of OU13 Final RFI/RI Work Plan



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Dear Mr Baughman

Enclosed is the Environmental Protection Agency's technical review of the Final RFI/RI Work Plan for Operable Unit 13, Rocky Flats Plant, submitted by the Department of Energy and its prime operating contractor, EG&G

As a result of this review, EPA concurs with the decision made by the Colorado Department of Health to withhold approval of this Work Plan. Continued problems with the rationale and procedures proposed in the field sampling plan must be resolved prior to granting approval of this document. In addition, there are several standard operating procedures cited in the Work Plan that have not yet been developed. Completion of both matters is necessary to assure that the proposed fieldwork will be conducted in an acceptable manner and that it will provide the desired results. If you or members of your staff have any questions regarding EPA's comments, please contact Gary Kleeman at 294-1071.

Sincerely,

Martin Hestmark, Manager  
Rocky Flats Project

Enclosure

cc w/enc  
Joe Schieffelin, CDH  
Rich Schassburger, DOE  
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ADMIN RECORD

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## 1.0 INTRODUCTION

A two-phase review of the final work plan consisted of first reviewing all DOE responses to agency comments on the draft final work plan. Secondly, the work plan was reviewed for technical merit. The technical review comments focus primarily on new or revised segments of the work plan. The only sections of the final work plan that were significantly revised were the site characterization (SC) and the field sampling plan (FSP). Therefore, the majority of the specific technical comments pertain to the SC and FSP (Sections 2 and 6) of the final work plan. The majority of EPA's comments were addressed in the review and comment form and the final work plan. However, some of the comments were inadequately addressed, or need further clarification. These problems are discussed in the following section. Editorial and typographical errors in the document were not addressed.

## 2.0 COMMENT AND RESPONSE EVALUATION

This section focuses on only those comments that were not incorporated or that were inadequately addressed in the final work plan. Specific comments not adequately addressed by DOE are referenced by the comment numbering scheme on DOE's review and comment form and are paraphrased.

- 1     General Comment 2     " many of the IHSS outlines used in this work plan are different in size and/or location from what is shown in the HRR and previous documents. Therefore, all changes made in this work plan to IHSS locations from previous delineations of the IHSSs must be clearly identified, documented and justified "

Response Evaluation     Changes have been made in the final work plan to all IHSS locations except to IHSS 158, the northern extent of which is still approximately 150 feet south of the originally mapped boundary. No justification could be found for this discrepancy in the work plan. Unless justification can be provided, the boundary of IHSS 158 must be extended approximately 150 feet north to agree with the previously mapped location for this site.

- 2     EPA General Comment 4     The Stage 2 sampling effort does not appear to be well thought out, in regard to Stage 2 activities. It seems that ground water (and soil) screening samples need to be collected using a hydraulic probing rig and small diameter probes (approximately 1") prior to drilling any boreholes to further delineate any contamination detected from the stage 1 surveys. Only after these data are analyzed and mapped should boreholes be located and drilled. In addition, some of the boreholes would need to be completed as monitoring wells immediately. The proposed plan does not mention completion of any Stage 2 boreholes as monitoring wells.

Response Evaluation The fact that the subsurface materials are cobbly and thus may inhibit the use of small diameter probing rods is a valid concern, however this technique is planned for use in OU 12. If for some reason the fieldwork at OU 13 does not occur as scheduled, it would be worthwhile in the meantime to determine the feasibility of such a method by either evaluating its success at OU 12 or by testing it independently at a few locations in OU 13. Certainly it would be more cost effective to define the extent of subsurface soil and ground water contamination using such a technique prior to placement of boreholes (in Stage 3) that would be optimally located and completed as monitoring wells. More comments regarding the use of ground water screening techniques and completion of monitoring wells are found in the technical review section.

- 3 EPA General Comment 4 Although on page 2-18 (page 2-58 in this version) it is stated that "Additional wells are needed that penetrate the bedrock to a depth deep enough to evaluate the presence of the No. 1 Sandstone," no details could be found in the field sampling plan that specified this type of activity. It is necessary to drill approximately 15' to 25' of bedrock in at least five different locations to make such an evaluation.

Response Evaluation Drilling only six feet into bedrock is not sufficient to completely evaluate the presence of the No. 1 Sandstone. This is supported by the fact that none of the wells presently existing in OU 13 have encountered this sand body and none have penetrated more than 10' of bedrock. Therefore it is necessary to drill approximately 15' to 25' of bedrock in at least five different locations that would be most likely to encounter this sandstone, in addition to the routine six foot penetration elsewhere. There should also be a provision to complete one or more monitoring wells in the No. 1 Sandstone, if it is encountered and contaminants are determined to be present. Also see specific comment 12.

- 4 EPA General Comment 4 The Stage 3 investigation does not include any surface water or sediment sampling. These media must be evaluated in determining the extent of OU13 contaminants. Information from ongoing "routine" monitoring, samples from other OU investigations, or additional sampling needed to provide the information required to support this determination must be identified.

Response Evaluation. The response that surface water and sediment sampling will be conducted as part of the RFP integrated sampling plan is not adequate, since that plan is not yet developed and available for review. This is one of several aspects of the final work plan which indicate that it is not yet complete.

- 5 EPA General Comment 4 Surficial soil samples and depth profile samples must be collected at a subset of the High Purity Germanium (HPGe) survey locations and analyzed to evaluate the vertical extent of radionuclide contamination.

Response Evaluation The information presented in the response does not correspond to the information added to the text of the report. The response indicates that surficial soil samples and depth profile samples will be collected at a maximum of three boreholes, which would certainly not be sufficient. The final work plan does specify the number of surficial soil samples by IHSS but only indicates that depth profile samples may be collected if they are determined to be needed. Also see general comment 2 and specific comment 8.

- 6 EPA Specific Comment 27 Table 5.4 Under radionuclides, this table must also include the detection/quantitation limits for strontium 89/90, strontium 90, cesium 137, radium 226, and radium 228, all of which are proposed analytes listed in the text on page 5-12.

Response Evaluation All radionuclides on Table 5.3 (previously Table 5.4) have been deleted. This omission must be corrected.

- 7 EPA Specific Comment 34 The soil gas survey proposed for this IHSS (152) must be extended down gradient in order to better investigate the presence of potential subsurface fuel oil contamination. By limiting the extent of the survey to the IHSS boundary, the location of such contamination may not be covered.

Response Evaluation Additional sampling points have been added, but the response indicates that if soil gas analyses indicate movement past these points, additional sampling will be conducted in Stage 3. Since the soil gas survey is a real time data collection method, it seems that additional sampling would be best conducted during Stage 1. This would also apply to similar situations at other IHSSs.

- 8 EPA Specific Comment 35 Last paragraph. It is stated here and elsewhere in the work plan that surficial soil samples will only be taken at the location of each borehole. This is certainly not sufficient in either size or distribution to characterize the nature and extent of contamination in surficial soils for this OU. A more extensive approach must be added to the FSP that also discusses and justifies the frequency of surficial soil sampling.

Response Evaluation The response on the review and comment form states "The sample spacing will be 20 feet where possible contaminant release sizes were small and greater than 20 feet where releases were larger or dispersed." The text of the work plan states that surficial soil samples will be collected on a 120-foot grid spacing. The correct grid spacing should be listed in both the review and comment form and the work plan.

### 3.0 TECHNICAL REVIEW COMMENTS

The following two subsections provide general and specific technical review comments on the final OU13 work plan. This work plan addresses the major technical flaws identified in the review of the draft final work plan. As requested by EPA, the FSP has been redrafted and detailed IHSS maps provided, a screening mechanism for detection of metals has been added, as has justification for the no further action recommendation at individual hazardous substance site (IHSS) 169. The following comments address inconsistencies and technical inadequacies. General comments relate to the work plan as a whole, whereas the specific comments correspond to specific sections of the report. The specific comments are referenced by page, section, and paragraph number where appropriate.

#### 3.1 GENERAL TECHNICAL COMMENTS

- 1 The spacing for the surficial soil samples is designated as 120 feet. The rationale for selecting this grid spacing must be provided. It was not explained in Section 5.1.2.4 as referenced. In addition, a review of the proposed sampling location maps for each IHSS revealed that the field sampling did not comply with the 120-foot spacing for all surficial soil samples. Deviations from the chosen grid spacing and an explanation for each deviation should be provided for each IHSS.
- 2 Surficial soil and vertical profile samples analyzed for radionuclides are proposed to be collected at a subset of HPGe locations to confirm the HPGe results and provide information on radionuclide distribution with depth. However, the descriptions of field activities at the individual IHSSs state that vertical profile samples may be taken depending on the results of the HPGe survey. Because radionuclide distribution with depth can be ascertained only with vertical profile samples, these samples must be collected for a specified subset of the locations.
- 3 Section 2.2 describes the existing analytical data for OU13 and compares them to background. Anything detected in concentrations above background levels may be a potential contaminant. The data are then related to the nature and extent of contamination at each IHSS. In most instances, the text states, the detected contaminants could not be attributed to an IHSS. This information and the historical activity descriptions were then used to create Table 5.2, Potential Contaminants Present in each OU13 IHSS. However, Table 5.2 does not always correlate to the discussion in Section 2.2. For some IHSSs, some contaminants detected above background are not included on Table 5.2, for example strontium 89/90 at IHSSs 1171 and 1172. In addition, some potential contaminants that are suspected from historical descriptions are not included on Table 5.2, for example, diesel fuel and gasoline at IHSS 171. To resolve this observed inconsistency in reporting potential contaminants, the rationale for including or excluding contaminants should be provided. Until all potential contaminants are correctly specified for each IHSS, an

assessment of the screening methods' ability to detect such contaminants cannot be completed

### 3.2 SPECIFIC TECHNICAL COMMENTS

- 1 Page 6-19, Table 6 3 Several of the standard operating procedures (SOPs) listed on this table are under development. These SOPs must be approved by EPA before field work begins at OU13. The procedures for collecting samples in the field must be clearly specified in the work plan or SOP to avoid confusion or problems in the field.
- 2 Page 6-24, Paragraph 4 The tripod-mounted HPGe radiological surveys proposed for OU13 provide soil concentration results representing a 23-foot diameter circular area. The OU12 work plan says the tripod-mounted HPGe will represent a 45-foot circular area. The height of the tripod mount must be listed in this paragraph so that the area of coverage is correctly known.
- 3 Page 6-35, Paragraph 2 In paved areas, the HPGe instrument will be set directly over a small opening in the pavement. This method will work but it will provide information only on that 4- to 8-inch square area. A 20-foot grid spacing was also chosen because, according to Gilbert (1987), this results in an acceptable probability of not finding an elliptical contaminated area approximately 16 feet by 32 feet in size. The relative size of contaminated paved areas at each IHSS in OU13 must be compared to this 16 feet by 32 feet ellipse to determine if this spacing is adequate to detect contamination. It should also be noted that in response to a CDH comment, it is stated that the HPGe survey spacing in paved areas would be 10 feet to account for the limited area of detection. The choice of a grid spacing for HPGe survey should be reevaluated and a proper rationale provided.
- 4 Page 6-35 and 6-36, last sentence It is stated here that locations of vertical profile samples will be chosen some time after the HPGe survey is conducted. Since the HPGe provides real time data, time and money can be saved by collecting these samples at the time the survey is at run by choosing those points where readings are greatest for vertical profile samples.
- 5 Page 6-41, Paragraph 4 The chosen 40-foot spacing for the soil gas survey at IHSS 117 3 is not appropriate for the size of possible releases that occurred here. 20-foot spacing is needed to adequately identify any existing contamination.
- 6 Page 6-45, Figure 6-6 This figure shows two of the three surficial soil samples to be located north of Sage Ave. and none located on the south side of the street. Since more than half of this IHSS is located south of Sage Ave., at least one surficial soil sample must be south of the street, within the boundary of this IHSS.

- 7 Page 6-50, Figure 6-8 Based on historical descriptions of potential releases from building 123 and the apparent eastward direction of groundwater flow in the area of IHSS 148, it seems unnecessary to conduct any sampling to the west of this building. Of course if soil gas or radiometric surveys indicate that the presence of contamination may extend to this area, the surveys should be conducted to define the limits of its extent
8. Page 6-65, Figure 6-11 This figure indicates that the uppermost two foot interval of boreholes will not be sampled for laboratory analysis of metals, radionuclides or semi-volatiles. This would leave a data gap between the surface scrape sample and the composite sample taken between two and eight feet. It is recommended that a composite sample of the top two foot interval also be taken and analyzed for TAL metals, TCL semivolatiles, and radionuclides, in order to provide a sufficient vertical profile of the extent of these potential contaminants
- 9 Page 6-66, Paragraph 3 It is stated here that ground water samples collected from boreholes using the Hydropunch technique will only be taken at those locations determined to have the highest level of contamination detected in the Stage 1 surveys. In order to confirm the presence or absence of contamination in ground water and to provide essential data for optimal placement of monitoring wells, it is necessary to sample the ground water using this or other techniques in all boreholes. If a particular boring is already scheduled to be completed as a monitoring well based on existing knowledge of ground water contamination at the location, Hydropunch ground water samples would not be needed
- 10 Page 6-66 and 6-67, last and first Paragraphs The criteria and rationale for determining which boreholes will be completed as monitoring wells is not stated here. If all boreholes will be plugged and abandoned upon completion of all sampling activities, how will the decision to complete them as monitoring wells be made at that time without sample analysis results? This is where subsurface soil and ground water screening techniques can be very useful and effective in optimizing the timing of completion and placement of monitoring wells
- 11 Page 6-71, Paragraph 1 This paragraph states that the 20-foot spacing for the HPGe survey will provide approximately 90 percent coverage of an area. This is incorrect, as a 20 foot spacing with a 23 foot field of view will actually provide 100 percent coverage of an area. This statement should be rewritten based on this comment and specific comment number 3
- 12 Page 6-73, Paragraph 3 It is stated here that boreholes will be drilled to the water table or six feet into bedrock, whichever comes first (unless they are planned as monitoring wells). The maps and cross sections provided in Section 2 of this work plan show the water table as being above the top of bedrock throughout OU 13. Therefore if boreholes are drilled in accordance with this statement, it is highly

unlikely that any would penetrate bedrock. This also contradicts the statement on page 6-64 that says all boreholes will be drilled six feet into bedrock. As discussed in comment 3 of section 2, in order to adequately characterize the subsurface geology at OU 13, all boreholes shall be drilled at least six feet below the top of bedrock and at least five boreholes need to penetrate 15' to 25' of bedrock.

- 13 Page 6-80, Table 6.5. This table does not list the sample container requirements for all of the proposed soil samples. Container requirements for laboratory HPGe analysis, asphalt laboratory HPGe analysis, and nitrate, chloride and sulfate analyses should also be listed on this table.
- 14 Page 7-1 and Figure 7-1. As this is the final version of the work plan, a final schedule is needed that will detail when all subtasks of the RFI/RI will begin and end. Therefore, the word "preliminary" must be deleted from the first and second sentences of page 7-1 and actual beginning and ending dates must be added to Figure 7-1 for each identified activity.